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lowing promotions have been made: Dr. C. B. Bazzoni to be professor of physics, Dr. George Gailey Chambers and Dr. Howard Hawks Mitchell to be professors of mathematics and Dr. Karl Greenwood Miller to be assistant professor of psychology.

DISCUSSION AND CORRESPONDENCE

THE GEOGRAPHICAL DISTRIBUTION OF HYBRIDS

It is often assumed by systematic botanists in this country that natural hybrids between species can only exist within the common range of the parent species. This opinion has been emphasized in a caustic criticism of Brainerd and Peitersen's recent article entitled "Blackberries of New England—their classification."¹ In the article cited,² the following expression appears:

... no one, not specially forewarned or gifted with remarkable intuition, finding *Rubus frondosus* ("R. pergratus × setosus") superabundant in Coos County, New Hampshire, *R. glandicaulis* ("R. allegheniensis × setosus") in the thickets of Prince Edward Island, where *R. setosus* is unknown, or *R. arenicola* ("R. Baileyanus × frondosus") dominant on dry barrens of Nova Scotia where *R. Baileyanus* is unknown and where *R. frondosus* is represented only by *R. recurvans*, can guess in which key to trace his species.

A number of similar quotations might be cited from the same source all involving the negation of the possibility of the occurrence of a hybrid beyond the range of the parent species.

It would seem reasonable to appeal to the better known floras of Europe in a case of this kind, and no one can perhaps be quoted with more effect on this important subject than Anton Kerner von Marilaun. In the second volume of his classic "Pflanzenleben," as well as in the "Osterreichische botanische Zeitschrift" (Vol. 21 (1871)), this distinguished author has cited a large number of cases of natural hybrids.

Perhaps the most interesting example in this connection is the hybrid *Nuphar intermedium* which is a cross between *Nuphar*

luteum and *Nuphar pumilum*, found distributed from the Black Forest and the Vosges northward into Russia and Lapland. In the southern part of its range, the hybrid is rarer and less fertile than it is further north. It is capable of extending its latitude northward of the range of both the parent species. Parallel cases are supplied by hybrids of *Epilobium*, *Brunella*, *Primula*, *Linnaria*, *Rumex*, *Micomeria*, *Pulsatilla*, etc. In these various genera Kerner describes hybrids between wild species which often occur beyond the range of one or both of the parent species. Since the data supplied by Kerner on this subject can scarcely be questioned, it would appear that the absence of one or both of the parent species of a supposed hybrid in a given region is no valid argument against the hybrid origin of such an intermediate form. We have apparently still much to learn from our European colleagues both as regards accuracy and breadth of view in the matter of geographical distribution of hybrids. In the light of the above it does not appear necessary that the statements of Brainerd in regard to probable natural hybrids of *Rubus* should be accorded less credence and respect than have been given to his classic results in the case of natural hybrids in the genus *Viola*.

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STAR DIAMETERS

TO THE EDITOR OF SCIENCE: Referring to the communication of Professor Fessenden concerning star diameters (SCIENCE, March 25, 1921, page 287-8), allow me to say that it does not seem possible that the measured diameter of Betelgeuse is affected by a gravitational displacement. In the first place, there are stars, of solar type for example, in connection with which the conditions would seem to be far more favorable for such a displacement and yet these objects show no appreciable disk. Further, we know that light reacts to a gravitational field in such a manner that there is no permanent acceleration in the direction of propagation. This fact reduces the possibility of a displacement to a

¹ Vermont Agricultural Experiment Station, Bulletin 217, Burlington, Vermont.

² *Rhodora*, Vol. 22, pp. 185-191.